



Ecommerce Hosting Provider Drastically Cuts Server Provisioning Costs Using Virtualized InfiniBand-based Solution and VMWare

One of the top-five ecommerce hosting operations, and global 500 company, this company caters to several vertical industries. The foundation for its Fortune 1000 customers is a virtualized server environment where virtual compute, network and storage resources are allocated to customers on a dynamic pay-per-use basis.

Challenges

A growing customer base is a good thing—assuming you can keep pace. Increased demands for resources and greater availability by customers were driving significant growth for this managed hosting services provider. However, rapid growth required continuous scaling of the company's managed services offering. Provisioning additional servers, storage and I/O resources at a physical level to meet these demands required significant expenditures for equipment, personnel and operations.

Before Mellanox, the hosting provider's IT infrastructure had grown to nearly 2,000 physical servers. Eighty-five percent of the environment was Microsoft Windows Server 2003-based machines running Microsoft SQL, .NET based application servers and IIS based Web servers. The other 25 percent consisted of machines running proprietary and value-added, transaction-oriented software applications built on Solaris and Linux.

Storage thin-provisioning technologies had alleviated some of the pain, but network and fiber channel capacity planning and cabling remained as constant growth barriers.

Since each server hosted a large number of applications, they all had to be equipped with an adequate number of I/O adapters. Multiple Gigabit Ethernet network interface cards (NICs) and Fibre Channel host bus

adapters (HBAs) were installed in each server. Each of these NICs and HBAs were then connected to multiple Ethernet and Fibre Channel switches to provide access to the LAN and SAN.

Provisioning I/O on adapters and switches was a physical-level exercise requiring considerable on-site human intervention. When additional network bandwidth or storage I/O capacity was needed, a technician had to manually add physical I/O adapters, rewire cables and connect them to new switch ports, provisioning the LAN and SAN sides appropriately. The situation was further complicated by the use of separate adapters and switches. For example, network connectivity relied on Gigabit Ethernet while storage connectivity was through Fibre Channel. As a result, provisioning new servers took as many as 10 days because of strict change control processes, and onsite personnel were needed to cable networks together. Worse still, whenever servers had to be repurposed to meet a new customer need, all of it had to be redone.

This I/O setup was very disadvantageous. It wasn't scalable. It was laden with manual configuration. It was power hungry. It put the provider in a position of deploying more slowly than its competition. And worst of all, capital and operating expenses were spiraling out of control with every bump in business growth.

Course of Action

After careful considerations, the managed hosting provider decided that a trifecta of virtualization provisioning was required: Storage, Server and Fabric. A unified and virtualized I/O solution would greatly complement the server and storage virtualization choices they had selected. The company chose Mellanox InfiniBand-based interconnect products to solve its challenges.

Test Configuration

The managed hosting provider built a proof of concept using two directors and four servers in one of its six global datacenters. Two 20 Gb/s InfiniBand adapters were used per server for high availability, replacing up to six Gigabit Ethernet NICs and up to four 2/4 Gb/s Fibre Channel HBAs in each server. High-speed connectivity to the LAN and SAN was then provided through a Mellanox InfiniBand-based I/O director chassis product which contained pluggable 10 Gigabit Ethernet option modules for connecting to the LAN and 4 Gb/s Fibre Channel option modules for connecting to the SAN.

The management software available with the I/O director chassis product enabled point-and-click provisioning of virtual I/O adapters on the server as well as auto-mated “virtual cabling” of the server’s virtual I/O ports to the LAN and SAN switch ports. Because the connectivity was virtualized, server personality and I/O configuration could now be dynamically changed without requiring any reconfiguration of the LAN and SAN infrastructure—a significant time and cost savings. Also, by using the pluggable 10 Gigabit Ethernet and 4 Gb/s Fibre Channel modules on the director, the available LAN and SAN bandwidth could be scaled up or down independent of server configuration.

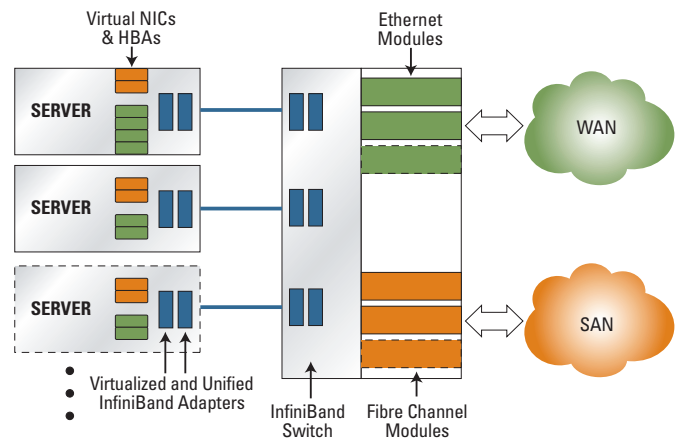
Mellanox InfiniBand Products Contribute to the Solution

In the test setup, a single Mellanox InfiniBand adapter delivered the bandwidth required to meet the I/O requirements of more than 50 virtual machines per VMWare ESX server. The channel I/O interface available in the Mellanox InfiniBand adapters enabled dynamic, software-based installation and removal of virtual NICs and HBAs and their associated virtual links. This feature alone would save the hosting company significant

amounts of time and resources that were previously required to manually reconfigure the infrastructure. In addition, the lossless fabric provided by InfiniBand would deliver the required quality of service needed to carry critical Fibre Channel traffic from the servers to the SAN, resulting in further time and expense savings through I/O consolidation.

Once the solution was deployed into the production environment, the ecommerce hosting provider saw significant results:

Objective	Benefit Achieved
Reduce the number of physical servers	The number of physical servers dropped from nearly 2,000 to only 150
Decrease server provisioning time	Average server provisioning time down from 216 hours to 12 hours
Simplify cabling complexity	Cabling complexity simplified by 70 percent
Lower I/O capital expenditure	Capital expenditures down 50 percent
Reduce I/O power consumption	Power consumption reduced 30–40 percent
Achieve ROI for the new I/O infrastructure	Immediate ROI realized through capital, labor and power savings



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